Camera Fiber-Link Product Manual

Part Number MAN-000004
Rev. J - March 2006

thinklogical™
a subsidiary of logical solutions

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1   Introduction

Introducing the Thinklogical Camera Fiber-Link System

1.1 Camera Fiber-Link

The Thinklogical. Camera Fiber-Link is a Camera-Link extension system. The Camera Fiber-Link system consists of a pair of components that are interconnected using a duplex multimode fiber optic cable, allowing Camera Link video support up to 1000 meters (3280 feet)* from the host computer. Each pair consists of a Camera side unit and a Frame Grabber side unit (both units are similar in appearance, but are labeled differently).

Note

*1000 meters (3280 feet) is the standard maximum distance for a fiber type of 50/125, 1000Mhz-km. See *Section Appendix D, Fiber Types vs. Distances,* on page 34 for maximum distances of other fiber types.

1.3 System Features

The Camera Fiber-Link systems are designed for high-resolution camera extension applications. The ability to remotely locate the CPU away from the camera allows more control of your computer environment. It is possible to position the camera in any setting while keeping the computer secure in a remote, controlled location.

Each Camera Fiber-Link system includes the following features:

- Supports the Camera Link base/medium/full1000 meters (3280 feet) configuration
- Extends digital video signals up to 1000 meters (3280 feet)
- Serial Port (RJ45) with RS232 Interface provided
- Transparent operation and functionality - no user interaction required
- Signal transmission via fiber optic cable - no RF interference
- Uses duplex multi-mode fiber for base configuration, 50 or 62.5 micron, with SC-type connectors
- Uses triplex multi-mode fiber for medium/full configurations, 50 or 62.5 micron, with SC-type connectors
- Units are self-contained and do not require user adjustments
- Two 2 Meter Camera-Link cables provided
  (Part Number: CBL-000007-002M)
- Two universal AC power adapters provided
  (Part Number: PWR-000022)

1.4 Technical Specifications

Each Thinklogical Camera Fiber-Link system is designed to the following specifications:

Supplied Cables	(1) KIT-000013 CAMERALINK W/RJ45 ADAPTER/CABLE KIT
	        Which contains the following:
	        (1) ADP-000007 DB9M TO RJ45F ADAPTER
	        (1) ADP-000008 DB9F TO RJ45F ADAPTER
	        (2) CBL-000001-002M CAT5 CABLE ASSEMBLY, 2 METERS
	(2 for Base Units/4 for Medium/Full Units) CBL-000007-002M MDR-26
	        MALE TO MDR-26 MALE CABLES, 2 METERS
	
	For Adapter Pinouts, please see *Section Appendix C, Adapter Pinouts,* on page 31

Connectors	**Frame Grabber side:** Camera Link MDR-26 female video input (2) Dual SC-type fiber connector (1) 2.5mm power connector (AC adapter provided and required) Serial Port - RJ45 connector (1) **Camera side:** Camera Link MDR-26 female video output (1) Dual SC-type fiber connector (1) 2.5mm power connector (AC adapter provided and required) Serial Port - RJ45 connector (1) **Note** The Camera Fiber-Link is available with Dual ST- or LC-type fiber connectors upon request.
Protocol	Camera Link compliant (supports base/medium/full configurations)
Indicators	Two LEDs on each Camera Fiber-Link module: Loss of Signal [LOS] (red ON when no signal) Power (green ON when power is applied)
Optical Cable	Duplex Fiber, multi-mode, 50 micron or 62.5 micron, SC-type connectors (Fiber Cable is either customer-supplied or can be ordered from Thinklogical; See *Section Appendix E, Fiber Optic Ordering Information,* on page 36 for Fiber Cable Ordering Information.)

Operating Temperature and Humidity	0 to 50 °C (32 to 122 °F), 5 to 95% RH, non-condensing
Housing Dimensions	Approx. 7 in x 5 1/2 in x 1-1/4 in high (177.8 mm x 139.7mm x 31.75mm high) Wall-mount keyhole slot spacing: 5 inches x 5 1/2 inches
Supply Voltage	+5.0 VDC. Adapter has Universal AC Power Input Polarity: Positive Tip
DC Current	Camera Side: 1.25A, typical; Frame Grabber Side: 1.3A, typical
AC to DC Adapter	Input: 100-240VAC, 47-63 Hz, 0.8 Amperes Output: +5VDC @ 5Amperes, 2.5mm barrel plug Logical P/N: PWR-000022; two included with each Camera Fiber-Link pair
LASER Output Specifications	Wavelengths are 778, 800, 825, and 850 nanometers Maximum Laser power output in the fiber is 1.6mW

2   Installation

2.1 Intended Application

The Camera Fiber-Link from Thinklogical permits the placement of a digital camera up to 1000 meters (3280 feet) away from the controlling computer without loss of resolution. Traditional copper cables are limited to 10 meters (32.81 feet) in such applications. Each Base or Medium/Full Camera Fiber-Link system consists of a pair of electronic units connected by a duplex multi-mode fiber optic cable. **The duplex fiber must be of equal length**. The Medium/Full system pair, in addition to the duplex fiber, also is connected by a simplex multi-mode fiber optic cable.The Frame Grabber unit connects to the computer with a 2 meter Camera Link MDR-26 male-to-male cable and the Camera unit connects to the digital camera.

Caution

The Camera Fiber-Link is a Class 1M LASER product that emits near infrared light.

Note

The fiber optic cables should be attached to the Camera Fiber-Link prior to powering up the units.

Note

It is necessary for the duplex multi-mode fiber to be of equal length.

2.2 Small Form Factor

Each Camera Fiber-Link module is wall-mountable, if desired. Mounting centers are provided with keyhole slots (Fiber cable and power connector up, MDR-26 connector and RJ45 connector down). A mounting template is provided at the end of this manual (Appendix B) for your convenience.

Figure 2.1 *Camera Fiber-Link Application diagram*
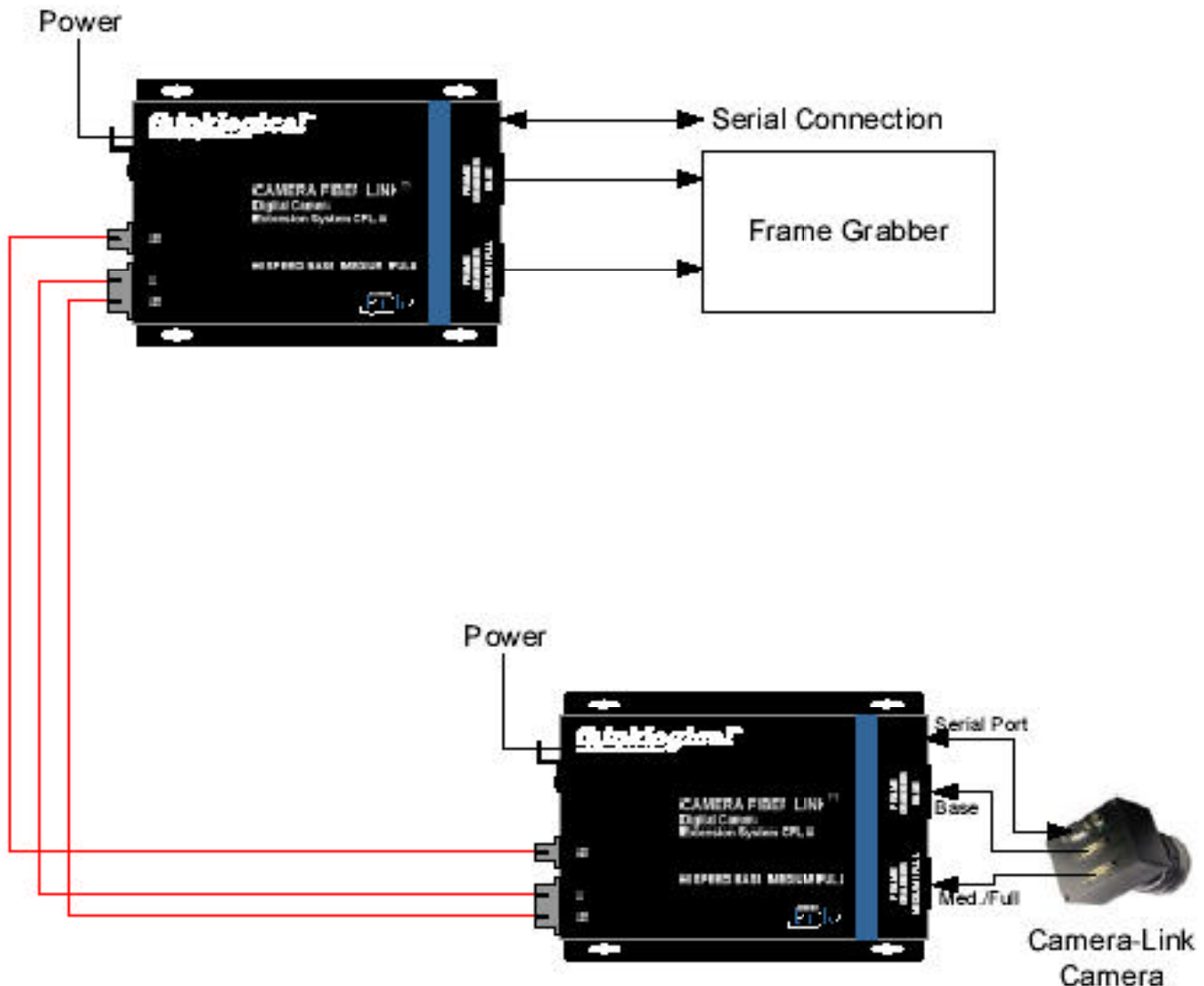
2.3 Order of Installation Events

Note

It is recommended to test the camera and frame grabber prior to installing the Camera Fiber-Link Extenders to verify their operation.

In order to properly use the Camera Fiber-Link system, you must follow this order of events for the initial power-up.

1.   Install and connect your Fiber Optic Cable between the Camera side and the Frame Grabber side modules.

Note

Be sure Fiber Optic Cable is positioned as below. The red LED, located on the fiber side of the unit, will blink if system is talking and Camera is not connected; it will be solid red if fiber is not connected.i
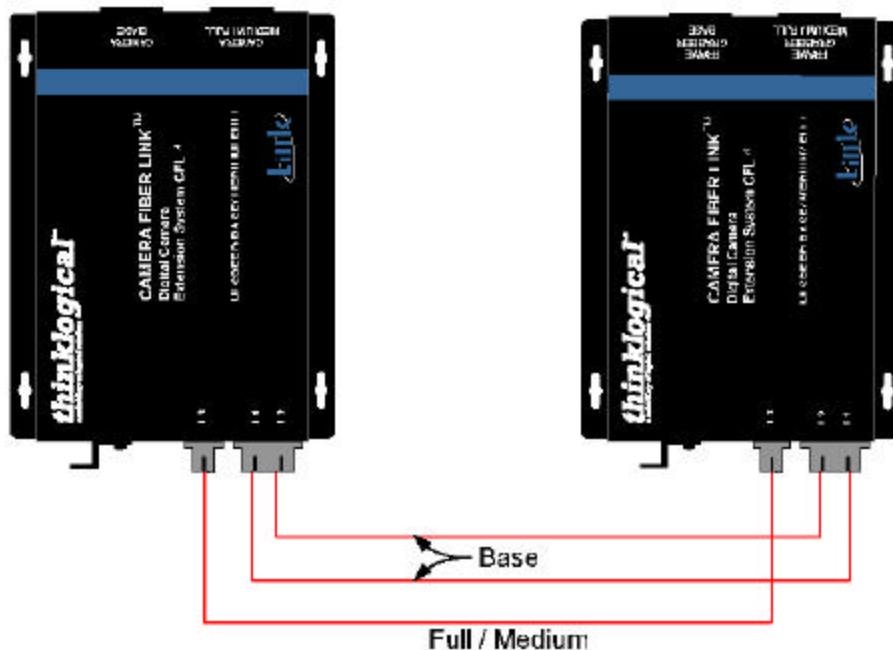
2. Connect the AC Power Adapters (PWR-000022) to both units, and plug them into a suitable power source.

3. Using CBL-000007-002M (MDR-26 Male to MDR-26 Male Cable), connect your camera to the Camera side unit, and turn on the camera.

4. Using CBL-000007-002M (MDR-26 Male to MDR-26 Male Cable), connect your frame grabber to the Frame Grabber side unit.

5. If using an external sensor, external lighting, etc, use CBL-000001-002M (CAT5 Cable) to connect your serial device to the Serial Port on the Camera Side and Frame Grabber unit.

6. Start your application software.

2.4 Connecting the Camera Fiber-Link system

All physical connections to the product use industry-standard connectors.

2.4.1 Fiber Cable

A duplex fiber optic cable (for Base version) or a duplex and a simplex fiber optic cable (for Medium/Full version) must be run between the location of the Frame Grabber unit (near your CPU) and the Camera side unit (near the camera). The standard duplex multi-mode fiber cable must be 50 or 62.5 micron, terminated with an SC-type connector and no longer than 3280 running feet (1000 meters)*. Be careful to not kink or pinch the fiber cable as it is being installed, and keep all bend radii to no less than 3 inches (76.2mm).

Connect your fiber cable to the SC-type connector on each Camera Fiber-Link pair (one Camera side and one Frame Grabber side). Dress the cable so it will not get crushed, pinched or otherwise damaged.

> **Note**
> It is necessary for the duplex multi-mode fiber to be of equal length.

> **Note**
> The Camera Fiber-Link is available with ST- or LC-type fiber connectors upon request.

> **Note**
>
> *1000 meters (3280 feet) is the standard maximum distance for a fiber type of 50/125, 1000Mhz-km. See Appendix D for maximum distances of other fiber types.

2.4.2 Digital Video Camera Side

The Camera side unit connects to your video camera using a MDR-26 male-to-male cable (CBL-000007-002M) which is supplied with the system. The Base version includes 1 cable and the Medium/Full version includes 2 cables.

2.4.3 Digital Video Frame Grabber Side

The Frame Grabber side unit connects to your controlling computers Frame Grabber with an MDR-26 male-to-male cable (CBL-000007-002M) which is supplied with the system. The Base version includes 1 cable and the Medium/Full version includes 2 cables.

2.4.4 Serial Port

Both the Camera side unit and the Frame Grabber side unit have a serial port (RJ45 connector). This RS232 interface connects to your external sensor, external lighting, etc., if needed, using a CAT5 Cable Assembly (CBL-000001-002M which is supplied with the system).

The pinouts of the Serial Port (RJ45 connector) are as follows:

LOGICAL SOLUTIONS
SERIAL PORT (RS-232) FOR CAMERA FIBER LINK EXTENDER
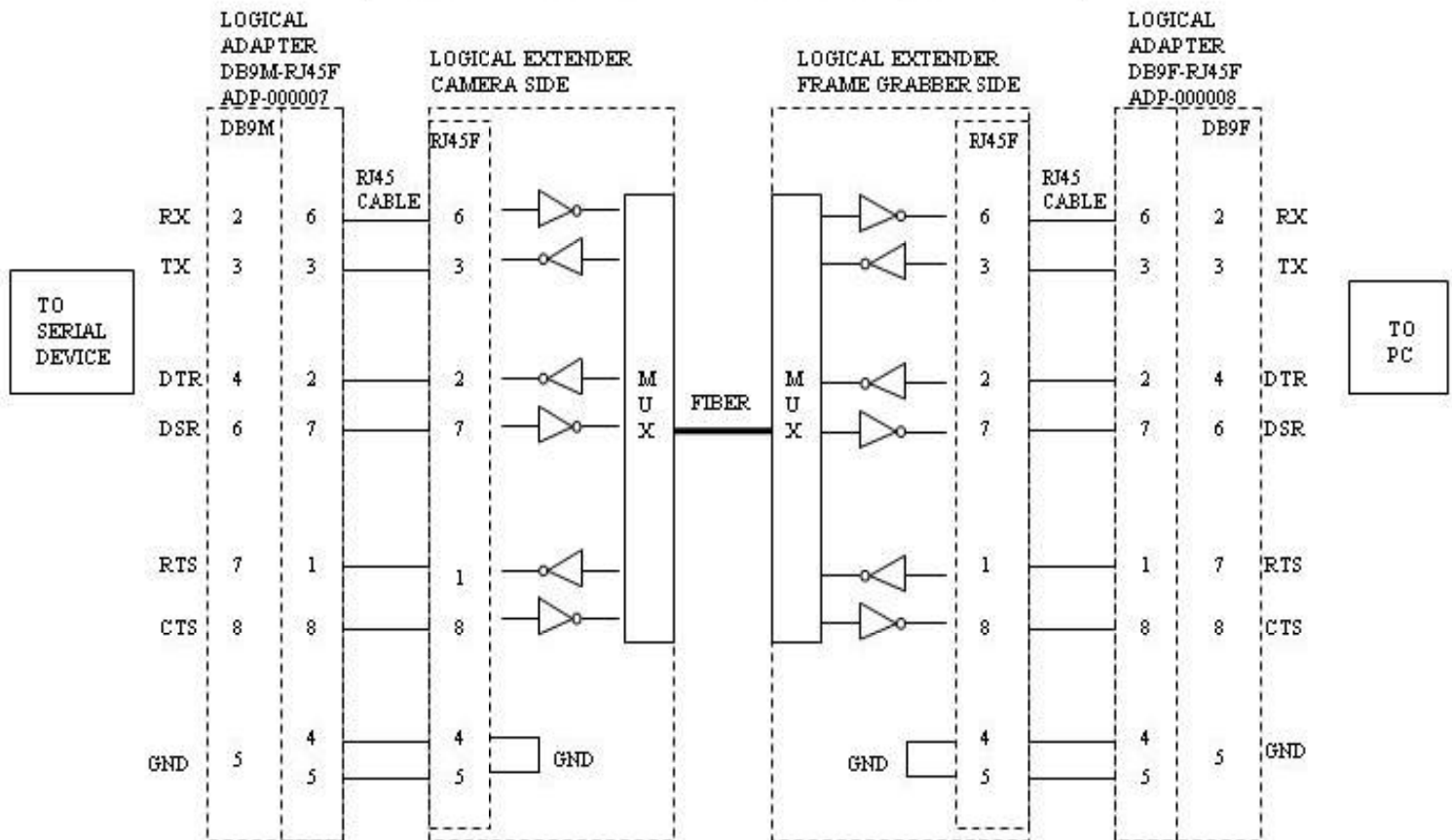
This Diagram shows the serial connections used as data terminal connections. Other uses are also possible using each signal to control A function at the camera end (lighting,etc).

2.4.5 AC Power

Separate wall-pack AC-to-DC converters (Part Number PWR-000022) are included. A power jack is provided on both units and accepts the +5VDC input. The green power LED will light when the unit is receiving power.

The DC power plug has a right-angle connector design.

The AC wall pack has a universal power rating (100-240VAC, 50-60 Hz), and also has slip-on receptacle 'fingers' for various AC power receptacles found throughout the world. Use the appropriate AC power 'fingers' for your country / location. The others are not needed.

Figure 2.2 *AC Power receptacle 'fingers' included with each power supply.*

3   Regulatory & Safety

Regulatory and Safety approval is pending at this time.

3.1 Safety Requirements

3.1.1 Symbols found on the Product

Markings and labels on the product follow industry-standard conventions. Regulatory markings found on the products comply with requirements.

3.1.1.1 Class 1M LASER Labeling

3.1.2 Product Serial Number

The Camera Fiber-Link products have a unique serial number, imprinted on a small silver label that is placed on the bottom of the chassis. The serial number includes a day-code. The format for the day-code is 2-digits each for the month, the day and four digits for the year, and two or three digits for a unique unit number. This serial number is also found on the original shipping carton.

3.1.3 Connection to the Product

Connections and installation hardware for the product use industry-standard devices and methods. All wiring connections to the customer equipment is done in a fashion to minimize proprietary or customized connectors or cabling. Power connections are made with regionally appropriate power cords and approved methods.

3.2 Regulatory Compliance

The Thinklogical. Camera Fiber-Link products are designed and made in the U.S.A. The Camera Fiber-Link products have been tested by a nationally recognized testing laboratory and found to be compliant with the following standards (both domestic USA and many international locations).

3.3 North America

These products comply with the following standards:
Safety
- UL60950 : 2000
- CAN/CSA C22.2 No. 60950-00

LASER Safety
- CDRH 21CFR 1040.10
- Class 1M LASER Product
- Accession Number 0322261

Electromagnetic Interference
- FCC CFR47, Part 15, Class A
- Industry Canada ICES-003 Issue 2, Revision 1

3.4 Australia & New Zealand

This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

3.5 European Union

3.5.1 Declaration of Conformity

Manufacturer's Name & Address
  Thinklogical.
  100 Washington Street
  Milford, Connecticut 06460 USA
  Telephone (203) 647-8700

Product Name
  • Model: Camera Fiber-Link Video Extension System

These products comply with the requirements of the Low Voltage Directive 72/23/EEC and the EMC Directive 89/336/EEC.

3.5.2 Standards With Which the Products Comply

Safety
  • IEC60950:1992+A1, A2, A3, A4, A11

LASER Safety
  • IEC60825:2001 Parts 1 and 2
  • Class 1M LASER Product

Electromagnetic Emissions
  • EN55022: 1994 (IEC/CSPIR22: 1993)
  • EN61000-3-2/A14: 2000
  • EN61000-3-3: 1994

Electromagnetic Immunity
  • EN55024: 1998 Information Technology Equipment-Immunity Characteristics
  • EN61000-4-2: 1995 Electro-Static Discharge Test
  • EN61000-4-3: 1996 Radiated Immunity Field Test
  • EN61000-4-4: 1995 Electrical Fast Transient Test
  • EN61000-4-5: 1995 Power Supply Surge Test
  • EN61000-4-6: 1996 Conducted Immunity Test
  • EN61000-4-8: 1993 Magnetic Field Test
  • EN61000-4-11: 1994 Voltage Dips & Interrupts Test

3.5.3 Supplementary Information

The following statements may be appropriate for certain geographical regions and might not apply to your location.

Note

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Note

This Class A digital apparatus complies with Canadian ICES-003 and has been verified as being compliant within the Class A limits of the FCC Radio Frequency Device Rules (FCC Title 47, Part 15, Subpart B CLASS A), measured to CISPR 22: 1993 limits and methods of measurement of Radio Disturbance Characteristics of Information Technology Equipment.

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigencies du Règlement sur le matérial brouilleur du Canada.

WARNING

This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

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4   How to Contact Us

4.1 Customer Support

Thank You to our Customers for choosing a Thinklogical product for your application. We appreciate your business and are interested in helping you successfully use our products.

Logical is here to help you. To contact Thinklogical, use the following telephone numbers and internet-based methods.

4.1.1 Website

Check out our website for current product offerings, support information, and general information about all of the Thinklogical we offer.

Our internet website offers product information on all current systems, including technical specification sheets and installation guides (for viewing on-line or for download), product diagrams showing physical connections, and other information you might need. We are constantly updating our website, so be sure to "refresh" your browser when visiting the Thinklogical website to see the most up-to-date information.

Internet: www.thinklogical.com

Note

Most online documents are stored as Adobe Acrobat "PDF" files. If you do not have the Adobe Acrobat Reader needed to view PDF files, visit www.adobe.com for this free download.

4.1.2 E-mail

Thinklogical is staffed Monday through Friday from 8:30AM to 5:30PM, Eastern Time Zone. We will try to respond to your email inquiries promptly, using the following email addresses for your different needs:

info@thinklogical.com -- Information on Thinklogical and our products

sales@thinklogical.com -- Sales Department - orders, questions or issues

support@thinklogical.com -- Product support, technical issues or questions, product repairs, requests for Return Authorization, any other issue.

4.1.3 Telephone

Telephone Sales: Contact our expert technically-oriented Sales staff via telephone in Milford, Connecticut, at **(203) 647-8700** or if in the continental US, you may use our toll-free number **(800) 291-3211**. We're here Monday through Friday, 8:30AM to 5:30PM, Eastern Time Zone. Ask for their direct dial phone number when you call!

Telephone Product Support: Contact Product Support via telephone in Milford, Connecticut, at (203) 647-8700. The support lines are manned Monday through Friday, 9AM to 5PM, Eastern Time Zone.

International Sales: Please contact our US Sales staff in Milford, Connecticut, at **(203) 647-8700**. We're here Monday through Friday, 8:30AM to 5:30PM, Eastern Time Zone (same as New York City). If leaving a voice message, please provide a 'best time to call back' so we may reach you at your convenience.

Our switchboard attendant will direct your call during regular business hours. We have an automated attendant answering our main telephone switchboard after regular business hours and holidays. You can leave voice messages for individuals at any time. Our Sales Representatives have direct numbers to speed up your next call to us.

4.1.4 Fax

Our company facsimile number is **(203) 783-9949**. Please indicate the nature of the fax on your cover sheet, and provide return contact information.

4.2 Product Support

Thinklogical.'s support personnel are available Monday through Friday from 8:30AM to 5:30PM, Eastern Time Zone.

If your application might require assistance at some time outside of our normal business hours, please contact us beforehand and we will do our best to make arrangements to help you with your Thinklogical products.

4.2.1 Warranty

Thinklogical.'s products carry a one year warranty, with longer-term warranties available at time of purchase on most products. Please refer to your product invoice for your product's Warranty Terms and Conditions.

For specific details about the product warranties, please contact Sales.

4.2.2 Return Authorization

If, for some reason, you need to return your Thinklogical product to us, please get a **Return Authorization Number (RA# or RMA#)** from Logical's **Product Support** department <u>before</u> sending the unit in. Return Authorization must include contact information (phone preferred) in the event we have any questions.

After receiving your RA Number, please ship the unit postpaid, with the RA# prominently displayed on the shipping container.

We will contact you about your product once we determine its status.

Products received without Return Authorization and/or Contact information may require additional attention on our part that may delay any desired service or support with your system.

4.2.3 Our Address

If you have any issue with the product, have product questions, or need technical assistance with your Camera Fiber-Link system, please call us **(203) 647-8700** and let us help.

If shipping something with an RA#, or if you'd like to write us, we are located at:

Thinklogical.
Attn: RMA Department
100 Washington Street
Milford, CT 06460 USA

5 How to Order

Camera Link Tansmitters and Receivers with Serial (RJ45) HIGH SPEED BASE

CFL-000003-ST	Camera Fiber-Link TX and RX pair, serial support RJ45, dual fiber, ST
CFL-000003-SC	Camera Fiber-Link TX and RX pair, serial support RJ45, dual fiber, SC
CFL-000002-LC	Camera Fiber-Link TX and RX pair, serial support RJ45, dual fiber, LC
CFL-000003-TXST	Camera Fiber-Link Transmitter/Camera Side, serial RJ45, dual fiber, ST
CFL-000003-TXSC	Camera Fiber-Link Transmitter/Camera Side, serial RJ45, dual fiber, SC
CFL-000003-TXLC	Camera Fiber-Link Transmitter/Camera Side, serial RJ45, dual fiber, LC
CFL-000003-RXST	Camera Fiber-Link Receiver / Frame Side, serial RJ45, dual fiber, ST
CFL-000003-RXSC	Camera Fiber-Link Receiver / Frame Side, serial RJ45, dual fiber, SC
CFL-000003-RXLC	Camera Fiber-Link Receiver / Frame Side, serial RJ45, dual fiber, LC

Camera Link TX and RX with Serial (RJ45) HIGH SPEED BASE/MEDIUM&FULL

CFL-000004-ST	Camera Fiber-Link TX and RX pair, serial support RJ45, Triple fiber, ST
CFL-000004-SC	Camera Fiber-Link TX and RX pair, serial support RJ45, Triple fiber, SC
CFL-000004-LC	Camera Fiber-Link TX and RX pair, serial support RJ45, Triple fiber, LC
CFL-000004-TXST	Camera Fiber-Link Transmitter/Camera Side, serial RJ45, Triple fiber, ST
CFL-000004-TXSC	Camera Fiber-Link Transmitter/Camera Side, serial RJ45, Triple fiber, SC
CFL-000004-TXLC	Camera Fiber-Link Transmitter/Camera Side, serial RJ45, Triple fiber, LC
CFL-000004-RXST	Camera Fiber-Link Receiver / Frame Side, serial RJ45, Triple fiber, ST
CFL-000004-RXSC	Camera Fiber-Link Receiver / Frame Side, serial RJ45, Triple fiber, SC
CFL-000004-RXLC	Camera Fiber-Link Receiver / Frame Side, serial RJ45, Triple fiber, LC

Camera Link Cables and Connectors

CBL-000007-002M	MDR-26 Camera-Link cable (2 Included CFL-3,CFL-4 (4 Included)
PWR-000022	Power supply, 5 volt Universal Adapter, replacement part for CFL-3 & CFL-4
ADP-000007	DB9M to RJ45F Adapter for SCS (1 Included)
ADP-000008	DB9F to RJ45F Adapter for SCS (1 Included)

The CFL-000003 consists of two power supplies, two 2 meter cables, one transmitter and one receiver.

The CFL-000004 consists of two power supplies, four 2 meter cables, one transmitter and one receiver.

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Appendix A   Camera and Frame Grabber Compatibility Chart

Tested Frame Grabbers	
Manufacturer	**Model**
Active Silicon	Phoenix PHX-D48CL
Bitflow	R3-CL
Bitflow	R3-PCI-CL13
Bitflow	R3-PCI-CL23
Bitflow	R64=PCI-CL-F
DALSA-Coreco	PC-Camlink
DALSA-Coreco	X64-CL iPro
DALSA-Coreco	X64-CL Dual
Datacube	MaxRevolution V2-1000 Full
Euresys	Grablink Value
Imperx	FrameLink
Matrox	Meteor II CL
Matrox	Helios XCL
Mikrontron	INSPECTRA-4C
Mikrontron	INSPECTRA-5
National Instruments	NI 1428 CL
National Instruments	NI 1426 CL
National Instruments	NI 1429 CL

**Cameras and Frame Grabbers Tested
with *Thinklogical* Camera-Link Extender**

Tested Cameras up to Full Configuration

Manufacturer	Model	Bits/pixel	Taps	Clock (Mhz)
Adimec	A1000m/S or m/D	8 or 10	/S:1, /D:2	40
Adimec	A1600m/S or m/D	8,10 or 12	/S:1, /D:2	40
Adimec	A2000m/S or m/D	8,10 or 12	/S : 1, /D : 2	40
Adimec	A4000m/S or m/D	8,10 or 12	/S : 1, /D : 2	40
Adimec	A4020m/S or m/D	8,10 or 12	/S : 1, /D : 2	40
Adimec	A1000c/S or c/D	8,10 or 12	/S : 1, /D : 2	40
Adimec	A1600c/S or c/D	8,10 or 12	/S : 1, /D : 2	40
Adimec	A2000c/S or c/D	8,10 or 12	/S : 1, /D : 2	40
Adimec	A4020c/S or c/D	8,10 or 12	/S : 1, /D : 2	40
Atmel	AVIIVA C2 CL 4010	8 or 12	2	60
Atmel	AVIIVA SC2 CL 4010	8/10 or 12	2	60
Atmel	AViiVA M2 CL 0514	8/10 or 12	2	60
Atmel	AViiVA M2 CL 201x	8/10 or 12	2	60
Atmel	AViiVA M2 CL 4010	8/10 or 12	2	60
Atmel	AViiVA SM2 CL 0514	8/10 or 12	2	60
Atmel	AViiVA SM2 CL 201x	8/10 or 12	2	60
Atmel	AVIIVA SC2 CL 4010	8/10 or 12	2	60
Atmel	AViiVA M4 CL 2014	8 or 12	2	60/120
Atmel	AViiVA M4 CL 6007	8 or 12	4	80/160
Atmel	AViiVA M4 CL 8007	8 or 12	4	80/160
Atmel	CAMELIA 8M C1	8/10 or 12	1	25
Atmel	CAMELIA 8M M1	8/10 or 12	1	25
Atmel	ATMOS 1M60	8/10 or 12	2	75
Atmel	ATMOS 1M30	8/10 or 12	2	37.5
Basler	L103k	8 or 10	2	20 per tap
Basler	L301KC/F	8 or 10	1	60
Basler	A202K	10	2	40
Basler	A404K	8 or 10	8	50
Basler	A501k	8	1	50
Basler	A504KC	8	10	67
Cohu	7700	10	1	40
Cohu	7800	8	1	40
Cohu	7900	8 or 10	1	20

**Cameras and Frame Grabbers Tested
with *Thinklogical* Camera-Link Extender**

Tested Cameras up to Full Configuration

Manufacturer	Model	Bits/pixel	Taps	Clock (Mhz)
Dalsa	Dalstar DS-21-02M30	8 or 10	2	40 per tap
Dalsa	Dalstar DS-22-2M30	8 or 10	2	40 per tap
Dalsa	1m28	10	1	28
Dalsa	Piranha2 P2-2X	8 or 10	2	40 per tap
Dalsa	P2-42-06K40	8	4	40
Imperx	IPX-VGA90	8 or 10	1	40
Imperx	IPX-VGA120	8 or 10	1	40
Imperx	IPX-VGA210	8 or 10	2	40
Imperx	IPX-1M48	8 or 10	2	40
Imperx	IPX-2M30	8 or 10	2	40
Imperx	IPX-2M30H	8 or 10	2	40
Imperx	IPX-4M15	8 or 10	2	40
Imperx	IPX-11M5	8 or 10	2	28
Imperx	MDC-1004	12	2	40
Imperx	MDC-1600	12	2	40
Imperx	MDC-1920	12	2	40
Imperx	MDC-2048	12	2	40
Imperx	MDC-4000	12	2	28
JAI	CV-M7+CL	10	1	40.49
JAI	CV-M4+CL	10	1	40.49
MIKROTRON	MC1302/03	8 or 10	2	66
MIKROTRON	MC1310/11	8	8	85
Photonfocus	MV-D1024-160-CL-8	8	2	80
Pulnix	TMC-1000-CL	24bit RGB	3	20
Pulnix	TMC-1400-CL	8	1	50
Pulnix	TMC-4000-CL	8	2	40 per tap
Pulnix	TMC-4100CL	10	2	40
Pulnix	TM6710CL	8	2	25.49

**Cameras and Frame Grabbers Tested
with *Thinklogical* Camera-Link Extender**

Tested Cameras up to Full Configuration

Manufacturer	Model	Bits/pixel	Taps	Clock (Mhz)
Redlake	MegaPlus II ES 11000	24bit RGB	3	25
Redlake	ES 2020	8,10 or 12	2-Jan	30/38
Redlake	ES 1603	8,10 or 12	1	12-Oct
Redlake	ES 4020	8,10 or 12	2-Jan	30/38
Redlake	ES 3200	8,10 or 12	1	12-Oct
Redlake	ES 1100	8,10 or 12	2-Jan	30/38
Redlake	ES 2001	8,10 or 12	2-Jan	30/38
Silicon Imaging	SI-1280	12	1	40
Sony	XCL-U1000	10	1	36
Sony	XCL-U1000C	24bit RGB	1	36
Sony	XCL-V500	10	1	24.5
Sony	XCL-X700	10	1	29.5
SVS-Vistek	SVS 085CFCL	10	1	43
Toshiba	1K-SX1	8	1	28.634

Appendix B   Camera Fiber-Link Mounting Template

Use appropriate fasteners and anchors of your choosing to mount each unit.

Note
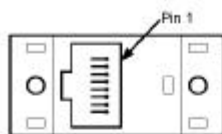Leave clearance (3 inch bend radius) for your Fiber Cable at top
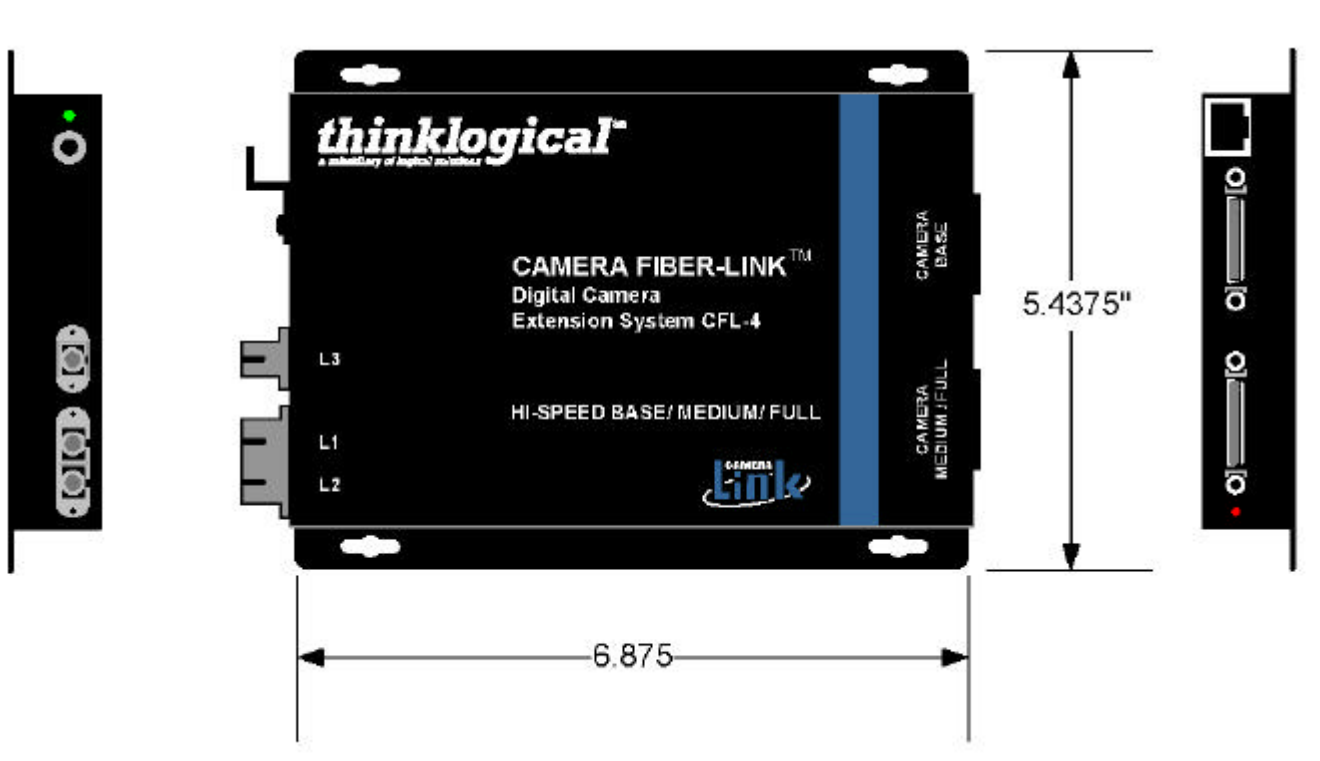
Appendix C   Adapter Pinouts

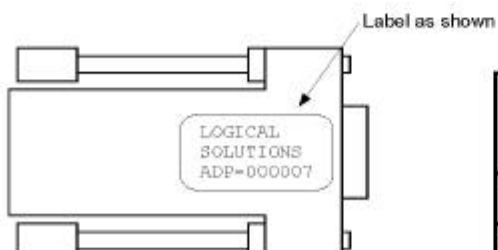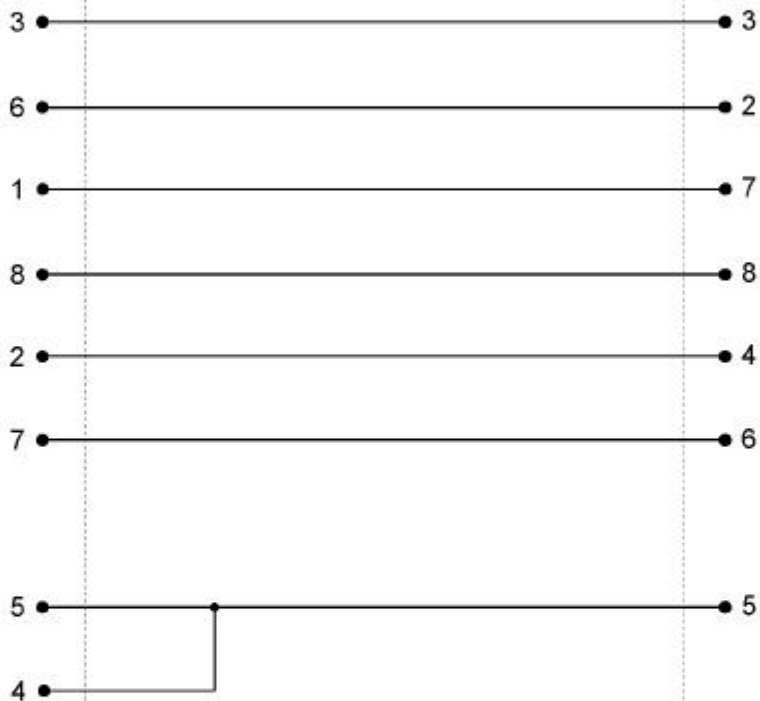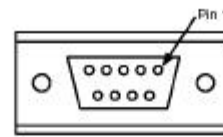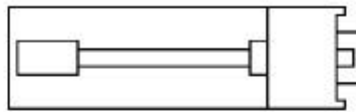The following pages show the pinouts for the listed adapters:

ADP-000007
ADP-000008

RJ45

DB9 Male

RJ45	DB9 Male
3	3
6	2
1	7
8	8
2	4
7	6
5	5
4	

Label as shown

LOGICAL SOLUTIONS ADP-000007

LOGICAL SOLUTIONS

Title: DB9M to RJ45F Adapter for SCS

Size: A

Part Number: ADP-000007

Rev: A1

Drawing Number:

Sheet 1 of 1

RJ45

DB9 Female

RJ45	DB9 Female
3	3
6	2
1	7
8	8
2	4
7	6
5	5
4	

Label as shown

LOGICAL
SOLUTIONS
ADP-000008

LOGICAL SOLUTIONS
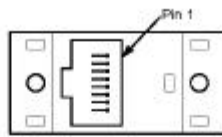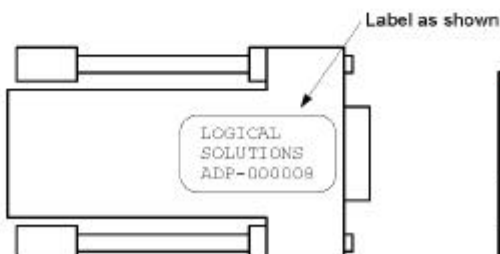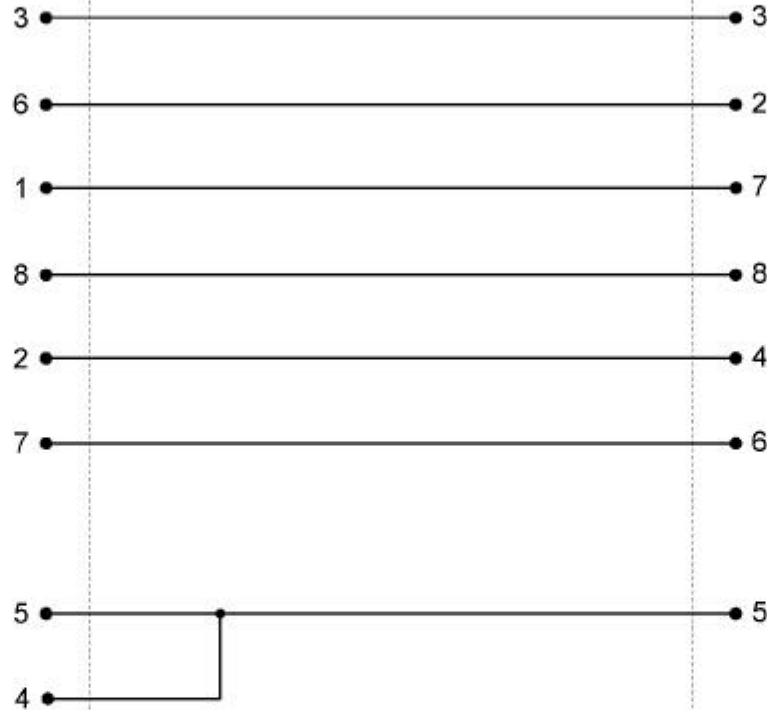
www.thinklogical.com
phone: 203-647-8700
fax: 203-783-9949

Title:	DB9F to RJ45F Adapter for SCS	
Size: A	Part Number: ADP-000008	Rev: A1
Drawing Number:		Sheet 1 of 1

Appendix D   Fiber Types vs. Distances

Camera Link Extender
Distance from camera to host computer
<Tested Full Configuration>

Fiber Type:50/125,400Mhz-km

Max Dist(m) Max Dist(f)
500   1,640

Fiber Type:50/125, 1000Mhz-km

Max Dist(m) Max Dist(f)
1000   3,280

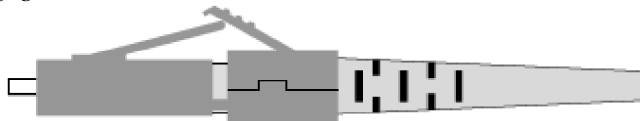### *Fiber Type: 62.5/125um, 160Mhz-km*

Max Dist(m) Max Dist(f)
220   720

Fiber Size	Numerical Atten.	Core Diameter	Clad Diameter	Coat Diameter	Typ. Attenuation	Max. Attenuation
50/125	.200 +/-.015	50 +/-3	125 +/-2	500 +/-25	2.6/0.6	3.5/1.2
62.5/125	.275 +/-.015	62.5 +/-3	125 +/-2	245/500 +/-25	2.7/.075	3.75/1.2

# Appendix E   Fiber Optic Ordering Information

Fiber Optic Connectors:

- *figure 1*

-
- **LC fiber connector**

This is the connector type used to connect to the DCS series of matrix switches. The small size and positive latching feature makes the LC the best choice for high density connector panel applications. It is an optional connector choice on many Thinklogical extenders.

- *figure 2*
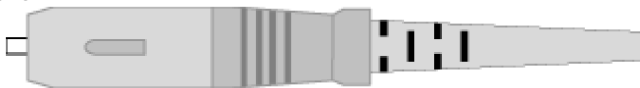
-
- **SC fiber connector**

The SC is a stackable connector used for quick connect and disconnect applications. It is available on many Thinklogical extenders as a no-charge option.

- *figure 3*

-
- **ST fiber connector**

The ST is a bayonet coupling style of connector. It has either a rugged plastic or metal housing depending upon manufacturer. It is reliable and uses the same ferrule as the SC. The ST is available on all Thinklogical extenders.

Fiber Optic Cable Assemblies:

Simplex Assemblies: Single fiber with either ST, SC or LC connectors at the ends. Both ends terminated at the factory.

Duplex Assemblies: Two fibers with either ST, SC or LC connectors at the ends. All ends terminated at the factory.

Plenum style assemblies are available. Please call for pricing.

Riser style Assemblies: Uses cable approved for use in non-air plenum applications.

Low smoke, zero halogen cable jackets are available. Please call for pricing.

Note: Patch cables are riser rated, however have a 2 mm diameter rather than 3 mm.

Fiber Cable Assembly Custom Formula

F C X — X X 0 X X X — X X X X

- F = Feet; M = Meters
- Length (Single Digit), 0 thru 9
- Length (Tens Digit), 0 thru 9
- Length (Hundreds Digit), 0 thru 9
- 1 = ST to ST; 2 = SC to SC; 3 = LC to SC; 4 = ST to SC; 5 = ST to LC; 7 = LC to LC
- 0 = 62.5 Micron Fiber; 1 = 50 Micron Fiber
- 0 = 3 mm (Standard) OD; 1 = 2 mm OD
- Always "0"
- Number of Fibers (Single Digit), 0 thru 9
- Number of Fibers (Tens Digit), 0 thru 9
- R = Riser; P = Plenum; T = Tactical; Z = Zero Halogen; O = Outdoor